

Claims

1. A system for serving map data and map-related services over a computer network to two or more clients, the system comprising:

a web server including:

first means having a first associated URL for defining at least one of the clients as a first type of map client;

second means having a second associated URL for defining at least another one of the clients as a second type of map client;

a map server including:

a first map-service pool having two or more first map-service objects or instances for answering requests from the clients for a first map service; and

a second map-service pool having two or more second map-service instances for answering requests from the clients for a second map service; and

means for establishing and maintaining a pool of two or more persistent network connections between the web server and the map server.

2. The system of claim 1, wherein the first means for defining at least one of the clients as a first type of map client, comprises at least one executable or compilable map-related object and at least one proxy for another executable or compilable map-related object.

3. The system of claim 1, wherein the first means for defining at least one of the clients as a first type of map client, comprises a remote-method-invocation object for enabling a client to communicate through a proxy for an executable map-related object with the executable map-related object.

4. The system of claim 1, wherein the first means for defining at least one of the clients as a first type of map client, comprises compilable or executable means for establishing and maintaining a map-data cache within a client.

5. The system of claim 1, wherein the first means for defining at least one of the clients as a first type of map client is compatible with a wireless personal digital assistant or mobile telephone.
6. The system of claim 1, further comprising a map-data cache operatively coupled to the first map-service pool for sharing cached map data across the two or more first map-service objects or instances.
7. The system of claim 1, wherein the first map-service pool provides geocoding services and the second map-service pool provides street-routing services.
8. The system of claim 1, wherein the first map-service pool provides one of map-data-access services, geocoding services, street-routing services, external-map-access services, and map-image-display services.
9. The system of claim 1, wherein one or more of the first map-service objects or instances is a proxy for a corresponding first map-service object or instance within a machine different from that hosting the map server.
10. The system of claim 1, wherein the map server further comprise a service dispatcher for receiving and routing requests to at least one of the first and second map-services pools.
11. The system of claim 1, wherein the web server and the map server reside within the same machine.
12. The system of claim 1, further comprising a map database coupled to the map server.

13. A system for serving map data and map-related services over a computer network to two or more clients, the system comprising:

a web server including:

first means having a first associated URL for defining at least one of the clients as a first type of map client;

second means having a second associated URL for defining at least another one of the clients as a second type of map client; and

a map server including:

a first map-service pool having two or more first map-service objects or instances for answering requests from the clients for a first map service; and

a second map-service pool having two or more second map-service instances for answering requests from the clients for a second map service.

14. The system of claim 13 wherein the first means for defining at least one of the clients as a first type of map client, comprises at least one executable or compilable map-related object and at least one proxy for another executable or compilable map-related object.

15. The system of claim 13, wherein the first means for defining at least one of the clients as a first type of map client, comprises a remote-method-invocation object for enabling a client to communicate through a proxy for an executable map-related object with the executable map-related object.

16. The system of claim 13, wherein the first means for defining at least one of the clients as a first type of map client, comprises compilable or executable means for establishing and maintaining a map-data cache within a client.

17. The system of claim 13, wherein the first means for defining at least one of the clients as a first type of map client is compatible with a wireless personal digital assistant or mobile telephone.

18. The system of claim 13, further comprising a map-data cache operatively coupled to the first map-service pool for sharing cached map data across the two or more first map-service objects or instances.
19. The system of claim 13, wherein the first map-service pool provides geocoding services and the second map-service pool provides street-routing services.
20. The system of claim 13, wherein one or more of the first map-service objects or instances is a proxy for a corresponding first map-service object or instance within a machine different from that hosting the map server.
21. The system of claim 13, further comprising a map database coupled to the map server.
22. A system for serving map data and map-related services over a computer network to two or more clients, the system comprising:
 - first means having a first associated URL for defining at least one of the clients as a first type of map client;
 - second means having a second associated URL for defining at least another one of the clients as a second type of map client; and
 - one or more map-service pools, each pool having two or more map-service objects or instances for answering requests from the clients for a common map service.
23. The system of claim 22 wherein the first means for defining at least one of the clients as a first type of map client, comprises at least one executable or compilable map-related object and at least one proxy for another executable or compilable map-related object.
24. The system of claim 22, wherein the first means for defining at least one of the clients as a first type of map client, comprises a remote-method-invocation object for

enabling a client to communicate through a proxy for an executable map-related object with the executable map-related object.

25. The system of claim 22, wherein the first means for defining at least one of the clients as a first type of map client, comprises compilable or executable means for establishing and maintaining a map-data cache within a client.
26. The system of claim 22, wherein the first means for defining at least one of the clients as a first type of map client is compatible with a wireless personal digital assistant or mobile telephone.
27. The system of claim 22, further comprising a map-data cache operatively coupled to the first map-service pool for sharing cached map data across the two or more first map-service objects or instances.
28. The system of claim 22, wherein the one or more map-service pools includes a first map-service pool that provides geocoding services and a second map-service pool that provides street-routing services.
29. The system of claim 22, wherein one or more of the map-service pools includes at least one objects or instances that is a proxy for a corresponding map-service object or instance within a machine different from that hosting the map server.
30. The system of claim 22, further comprising a map database coupled to the map server.
31. A machine readable medium comprising instructions for causing one or more computer system to emulate the system of claim 22.

32. The machine-readable medium of claim 31, wherein the medium comprises an electrical signal or one or more active or passive optical, electronic, magnetic storage devices.
33. A web server for providing map data and map-related services over a computer network to two or more clients, the web server comprising:
- first means having a first associated URL for defining at least one of the clients as a first type of map client; and
- second means having a second associated URL for defining at least another one of the clients as a second type of map client.
34. The web server of claim 33 wherein the first means for defining at least one of the clients as a first type of map client, comprises at least one executable or compilable map-related object and at least one proxy for another executable or compilable map-related object.
35. The web server of claim 33, wherein the first means for defining at least one of the clients as a first type of map client, comprises a remote-method-invocation object for enabling a client to communicate through a proxy for an executable map-related object with the executable map-related object.
36. The web server of claim 33, wherein the first means for defining at least one of the clients as a first type of map client, comprises compilable or executable means for establishing and maintaining a map-data cache within a client.
37. The web server of claim 33 wherein the first means for defining at least one of the clients as a first type of map client, comprises:
- at least one proxy for another executable or compilable map-related object; and
- a remote-method-invocation object for enabling a client to communicate through the one proxy with the map-related object.

38. A server for providing map data and map-related services over a computer network to two or more clients, the map server comprising:
- a first map-service pool having two or more first map-service objects or instances for answering requests from the clients for a first map service; and
 - a second map-service pool having two or more second map-service instances for answering requests from the clients for a second map service.
39. The server of claim 38, wherein the first map-service pool provides geocoding services and a second map-service pool provides street-routing services.
40. The system of claim 38, wherein one or more of the map-service pools includes at least one object or instance that is a proxy for a corresponding map-service object or instance within a machine different from that hosting the server.
41. A machine readable medium comprising instructions for causing one or more computer system to emulate the server of claim 39.
42. The machine-readable medium of claim 41, wherein the medium comprises an electrical signal or one or more active or passive optical, electronic, magnetic storage devices.
43. A computer system comprising:
- a data store containing map data;
 - a server operatively coupled to the data store and containing a set of map-manipulation objects;
 - a first map client operatively coupled to the server and having the set of map-manipulation objects; and
 - a second client operatively coupled to the server and having a subset of the set of map-manipulation objects and one or more proxy objects corresponding to objects in the set of map-manipulation objects.

44. A method of distributing map data through a common server to two or more clients over a communication network, the method comprising:
- communicating a first map-related applet to a first one of the clients in response to a first one of the clients connecting to the common server;
 - communicating a second map-related applet to a second one of the clients in response to a second one of the clients connecting to the common server;
 - receiving first and second requests for map data from the first and second clients; and
- responding to the respective first and second requests in first and second different ways based on differences in the first and second map-related applets, with responses to the requests including map data from a common map database.
45. A method of responding to a request for map data from a map-related database, the method comprising:
- communicating at least a portion of the request to a map-services pool including two or more map-service objects or instances capable of carrying out the portion of the requests; and
 - selecting one of the two or more map-services objects or instances to carry out the portion of the request.
46. The method of claim 45, wherein selecting one of the two or more map-services objects or instances comprises selecting one of the map-services objects or instances that is idle.
47. The method of claim 46, selecting one of the map-services objects that is idle comprises determining if at least one of the map-services objects or instances is idle; and if at least one of the map-services objects or instances is determined to be idle, creating a new map-services object or instance and selecting the new map-services object or instance to carry out the portion of the requests.

48. The method of claim 45, wherein at least one of the map-services objects or instances is a proxy for a corresponding map-services objects or instance on a machine different from that hosting the map-services pool.

49. A method of operating a map server for distributing map data to two or more clients over a communication network, the method comprising:

storing first map data in response to a first request from a first one of the clients in a portion of local server memory having a predetermined size;

communicating the first map data to the first one of the clients;

searching the local memory of the map server in response to a second request from a second one of the clients; and

communicating at least a portion of the first map data to the second one of the clients after searching the local memory of the map server.

50. The method of claim 49 further comprising:

storing second map data in the portion of local server memory having the predetermined size;

determining whether third map data found in response to a third request from one of the clients fits in the portion of the local memory of the map server; and

in response to determining that the third map data does not fit in the portion of the local memory, overwriting at least a portion of one of the first map data and the second map data with the third map data based on which of the first map data or the second map data was last used or which one of the first map data or the second map data is geographically more relevant to the third map data.